Gendai-ka Saretsutsu Togo wo Tamotte - Mirai wo Mezasu Suisu-Kokutetsu

Hürlimann, Gisela

Other titles: Modernized but still integrated: the Swiss Federal Railways on the path towards the future (1950s to 2000)

Originally published at:
Hürlimann, Gisela (2013). Gendai-ka Saretsutsu Togo wo Tamotte - Mirai wo Mezasu Suisu-Kokutetsu. Tetsudo Shigaku, (31):33-40.

Übersetzungsvorlage von: Hürlimann, Gisela, Gendai-ka Saretsutsu Togo wo Tamotte - Mirai wo Mezasu Suisu-Kokutetsu. In: TETSUDO SHIGAKU ("Japan Railway History Review"), No. 31, October 2013, p. 33-40 (übersetzt von Ayumu Banzawa).

Modernized but still integrated: The Swiss Federal Railways on the path towards the future (1950s to 2000)[1]

Gisela Huerlimann
Research Center for Social and Economic History at the University of Zurich

1. Introduction

"With their Shinkansen trains, the Japanese once inaugurated a renaissance of the railway. Now, the Swiss Federal Railways are the first railway to upgrade an entire rail network at one swoop" (Benedikt Weibel, NZZ, 19.10.2004). With these words, Benedikt Weibel, then the CEO of the Swiss Federal Railways, summed up a forty-year history of modern railway development: The beginning of the railway highspeed era in 1964 thanks to Shinkansen, and the opening of Rail 2000, the biggest railway enhancement project in Switzerland up to the 1990s. This paper is about a three-fold story: 1st about the international transfer of ideas, 2nd about the Swiss way of dealing with high speed, and 3rd about institutional change. In the sum, it is the story of the Swiss Federal Railways path to the "Railway of the Future", as it was internationally planned and realized since the 1950s/1960s[2].

2. Analytical paradigms for an investigation of railway modernization after 1950

Three main paradigms or trajectories[3] can be identified in the debate concerning railway modernization in the 1950s and 1960s:1st: a *high speed paradigm*, 2nd an automation or *cybernetic* paradigm and 3rd a *market and public service* paradigm. With the term "paradigm", I refer to a common conviction of international railway engineers and managers that railways should stand up to cars and planes by investing into high speed and into automation. The third paradigm came to full fruition in the 1980s and 1990s: It contains the belief that railway

[1] Revised paper for the transnational workshop: "Comparing the Histories of Management in the Railway Industry: Integration or Competition?", Kyoto University, February 16th 2013.
[2] Cf. The term „the railway of the future" as used by Louis Armand in: Internationale Eisenbahn-Nachrichten, 2/1965 in the context of a translated essay of Armand in the Japanese journal: Kotsu Shimbun.
[3] Cf. for the terms "paradigm" or "trajectories": Thomas S. Kuhn, The Structure of Scientific Revolution, Chicago 1962; Giovanni Dosi, Technological paradigms and technological trajectories: A suggested interpretation of the determinants and directions of technical change, in: Research Policy, 11/1982, S. 147-162.

companies should be disintegrated – separation between track management and business operators for example -, privatized and compete against one another. In the same context, the problem of debts was to be resolved: On the one hand by adopting the principles of commercial enterprises and on the other hand – at least in the case of Western Europe – by settling new agreements with the state: Those kind of traffics which would never be cost-effective, but which were socially, democratically and also economically still necessary, should be subsidized by the state. This was especially the case for commuter traffic. In Switzerland, the federalist motive was and is also of high importance: The fact, that all the cantons want to equally enjoy the benefits of public (rail) traffic. We can make out an international and a trans-European railway-modernization discourse which overlap in some areas: Transnational railway organizations and networks such as the *International Railway Association* (UIC) generated shared visions and models for the "European Railway of the Future". They were convinced that the expansion of the rail network was a contribution to sustainable post-war peace and the political unification of Europe. Such beliefs were also expressed in the international rail cybernetics congresses taking place in the 1960s and 1970s. In November 1963, a year before the Tokyo Olympic Games and the inauguration of Tokaïdo Shinkansen, the UIC held its first *Congress on Railway Cybernetics*. In his opening speech, Louis Armand, secretary general of UIC, declared the will to convert the railway traffic into the "most automatic system of the future"[4]. For railway engineers, the railway was a prototype of a cybernetic system. As railways are bound to tracks of some sort and must be managed in a centralized way, the railway system can be defined as "loop" with feedback mechanisms. At the 1970s conference in Tokyo, Hiroshi Shinohara, head of the automation laboratories of Japanese National Railways, defined the aim of Automatic Train Control as to create a "closed loop", where humans would only supervise and monitor[5]. The railway cybernetic discourse unites three main aspects: First of all, the aspect of general planning and prognosis. Second, it is about automation, men-machine-interfaces and safety – also allowing for high-speed – and for rationalization purposes. The third aspect refers to the integrative driving forces of *large technical systems*[6] and infrastructure networks which contribute to

[4] Internationale Eisenbahnkongressvereinigung, ed., Symposium über die Anwendung der Kybernetik bei den Eisenbahnen, Paris, 4.-13.11.1963, Brüssel 1963, p. S. 4.

[5] Hiroshi Shinohara, Die Automatische Zugführung, in: Internationaler Eisenbahnverband et al. ed., Drittes internationales Symposium, „Kybernetik im Eisenbahnwesen", Tokio 12.-17.4.1970, Paris ca. 1970, p. 205-213.

[6] Cf. Thomas P. Hughes, The Development of Large Technical Systems, in: Wiebe E Bijker/Thomas P. Hughes/Trevor J. Pinch, eds., The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology, MIT 1987, p. 51-82.

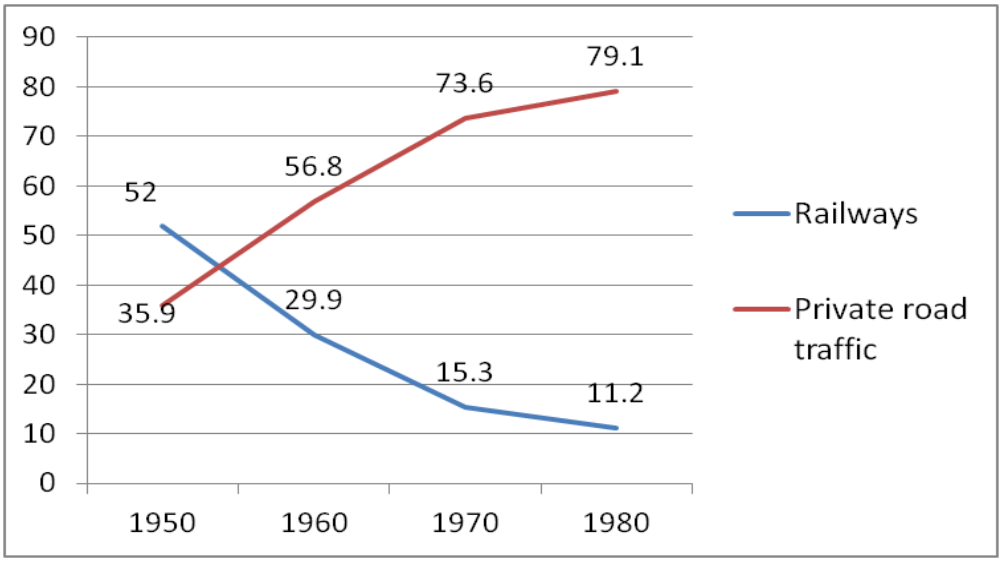
state building[7] and play an important role in national economies. But automation not only served to raise the railways' productivity and safety. It was and is also meant to facilitate transnational traffic and border crossing thanks to interoperability. Last but not least, the international railway network was also capable to transcend the political boundaries built by the Cold War by uniting railway engineers and officials of Western and Eastern Europe, of North America and Japan alike. Enhanced safety, interoperability and international cooperation were also needed for the greater vision of a high-speed train network in Western Europe of which the Swiss railways wanted to be part.

3. The Swiss path to the "Railway of the Future"

"The Swiss Railway bound for 2000", such was the headline of a newspaper article in December 1969 which reported about the Swiss Federal Railways future plans. The day before, SBB had publicly presented their project for a high-speed rail net. In this plan, the future traffic time between the major cities Bern and Zurich should be reduced to either 40 minutes thanks to 200 kmpH traffic speed or even to 30 minutes thanks to 300 kpmH.[8] At that time, maximum speed on Swiss tracks was 120 kmpH. SBB engineers explicitly linked their ideas with international projects and plans being discussed one year earlier in an international conference on highspeed rail traffic in Vienna (1968). The role model for most of the international high speed rail projects was the Japanese Shinkansen, first realized in 1964 between Tokyo and Shin-Osaka[9]. The Swiss railway innovators also referred to the "excellent experiences" made with Shinkansen, when they advocated for major investments and changes.[10] The Swiss "Railway of the Future" as it was designed in 1969, contained the three paradigms mentioned above: automation, high speed and market/financial reforms and generally a modernized, improved and more attractive railway. The motives for all these costly projects were obvious: Railways faced major economic problems from the 1950s onwards because of car and air competition mainly, as also Swiss data show:

Share of railway and private road traffics in %, 1950 to 1980

[7] Cf. Johan Schot/Thomas J. Misa/Ruth Oldenziel, Inventing Europe: Technology and the Hidden Integration of Europe, in: History and Technology, Vol. 21, Nr. 1/2005, p. 1-20.
[8] Baumann, Oskar, Die SBB auf dem Weg ins Jahr 2000, Luzern 1970 (publication of the oral paper presented on 6.12.1969 by O. Baumann in Lucerne).
[9] Roderick A. Smith, The Japanese Shinkansen: Catalyst for the renaissance of rail, in: The Journal of Transport History, Vol. 24, Nr. 2/2003, p. 222-237.
[10] Cf Jean-Pierre Berthouzoz,, Kommerzielle Überlegungen zum Projekt einer Schnellbahn Bern-Zürich, in: Gesellschaft der Ingenieure der SBB, Attraktiver öffentlicher Verkehr: Beiträge aus der beruflichen Tätigkeit unserer Mitglieder, (Sonderdruck Schweiz. Bauzeitung Hefte 25/47, 1973), p. 21-24.



Data source: LITRA traffic data / graph: G. Huerlimann

In 1950, more than half of Swiss traffic customers would travel by railway, whereas somewhat more than one third used private cars and motorcycles. Only ten years later, this relation became more than reversed, also due to the improvement of roads and the building of a national highway system. The latter, accepted in a federal vote in 1958, also influenced the project of a *High speed Rail Network.*

This map shows the planned new high speed line between Zurich, the economic, and Berne, the political capital of Switzerland:

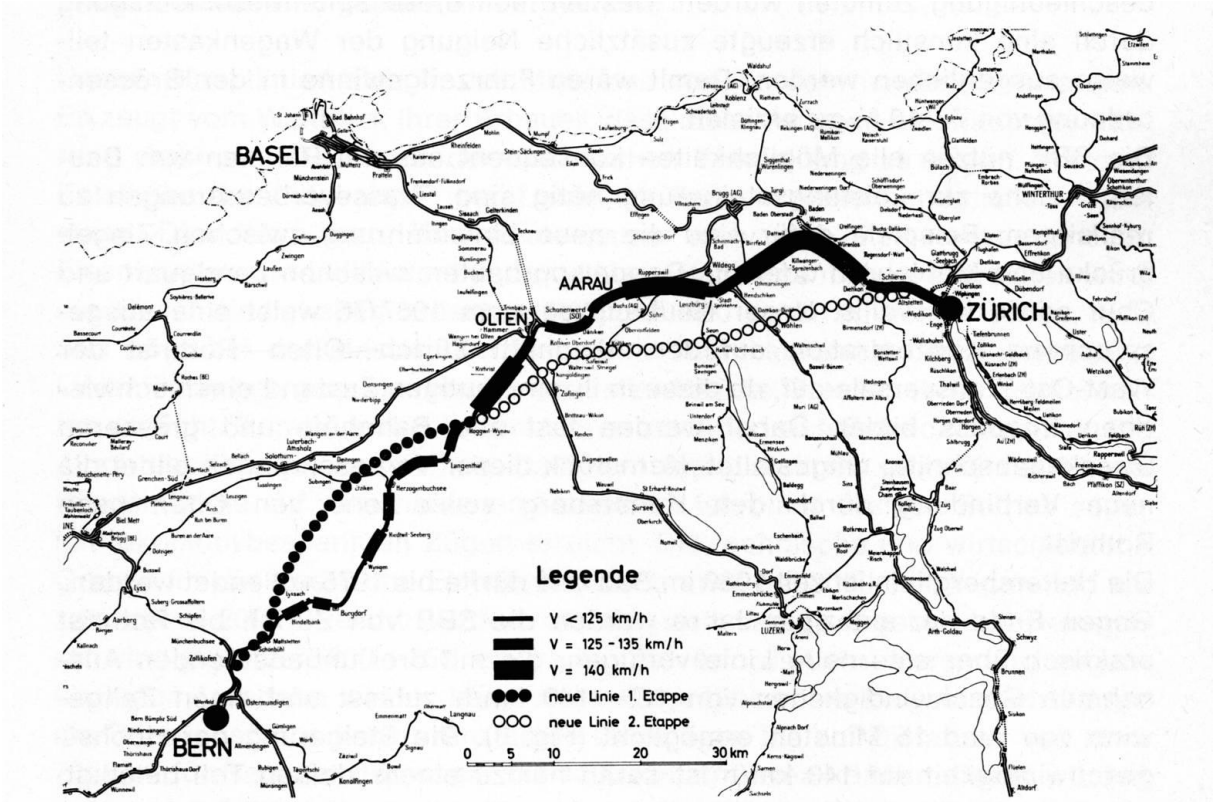


Fig. 8: Schnellverkehrslinie Bern—Zürich / Ligne à grande vitesse Berne—Zurich / Linea per il traffico rapido Berna—Zurigo / The future Berne—Zurich high-speed line

Source: Oskar Baumann (1970), as mentioned above.

By 1977, these high speed lines were integrated into a whole vision of "New Railway Transversal Lines", encompassing also Alpine base tunnels, as they have been opened in 2007 on the Loetschberg route and will be inaugurated in 2016 on the Gotthard route, both meant to enhance mainly (high speed) transalpine cargo traffic, but also passenger rail traffic. These new lines refer to the transnational European network of main and also fast railway lines in the 1970s. But instead of having a high speed Shinkansen-network and privatized rail companies as in Japan, the Swiss railways nowadays run at a maximum speed of 200 kpmH on limited track lines whereas normal maximum speed is 160 kpmH – and SBB is still an integrated and state-owned company. So why did the Swiss case develop differently to the German railway system with ICE and the privatization of "Deutsche Bahn" or to the Japanese case?

4. Travel reduction thanks to a time table innovation

Limited space given on the small Swiss territory limits speed in a natural way. Apart from that, it invites to conceive the railway network of the whole country as a sort of enlarged metropolitan transport area. This was exactly the idea, when a group of young engineers and

managers at SBB adapted the Dutch time table model for the densely populated "Randstad" area to the Swiss case in the early 1970s[11]. They called their innovation, a fixed interval time table type: "rhythmic time table"[12]. This project which had to initially surmount bureaucratic perseverance and risk adversion, was finally introduced in May 1982, when the time table on the whole SBB net was changed to a one-hour iteration – in later years, the recurrence interval sunk to 30 minutes or even to 15 minutes on shorter distances.

This time table innovation has allowed for an alternative path for higher transport velocity, although this was not the innovators original plan: For in the 1970s, the projected high speed lines found severe opposition by land owner sometimes supported by local authorities. But more than that, the mere idea of speeding up the main lines did cope neither with the Swiss democratic spirit nor with federalist realities or with overall planning ideas: Since the 1940s, the planning ideal was to avoid major metropolitan areas and instead foster a chain of settlements ranging from major cities to small towns. All of them had to be well accessible and equipped with infrastructure networks. So the public, democratic consultation of the SBB project for "New Railway Transversal Lines" clearly yielded a negative result and showed that SBB and the federal authorities had to redesign their project if they wanted to avoid a defeat at the ballot box. The solution consisted in improving the whole railway net instead of concentrating investment onto a set of high speed lines. This also responded to the ecological turn in the 1970s/1980s and to the "Zeitgeist"- preference for "the local". Finally, SBB also changed their marketing strategy from a technocratic imagery to focussing on the "citizen's benefit": In 1985, a leaflet showing Swiss people of different age and social class, in working and leisure clothes, advertised for *Rail 2000*, as was the new title for the redesigned infrastructure project. The slogan said: "More railway(s) for everybody!" And marketing worked: On 6.12.1987, the project *Rail 2000* won a majority of voters ready to invest more than 5 billion CHF into the biggest railway improvement and building project until the 1990s – with the integrated fixed interval time table as a guiding principle for planning and investment.

But *Rail 2000* still did involve some building of new and straighter tracks, because distances between major cities had to be abbreviated and brought into a one-hour distance. Tilting trains and/or automatic train control (ATC), which allows to lower the signal headway, were also

[11] The innovators' team at SBB explicitly referred to the „Spoor naar 1975", the Dutch five-year-plan; Jean-Pierre Berthouzoz/Hans Meiner/Samuel Stähli, Taktfahrplan Schweiz: Ein neues Reisezugkonzept, Choindez, 16.6.1972.

[12] In German: Taktfarplan, in French: horaire cadencé.

put into operation where new tracks met too much opposition or were too costly. *Rail 2000* was developed from 1987 until 2004, when it's "first stage" was officially completed. Since then, various new strategies for a railway for the 21st century or, as it is termed now, the "Future Development of the Railway Infrastructure", have been debated, developed and secured with several popular votes in the 1990s granting billions of Swiss francs for these projects and for the "New Rail Link through the Alps" (NRLA), consisting of the above mentioned Alpine base tunnels. This important approval by voters and taxpayers already explains partly why SBB is still an integrated and public company.

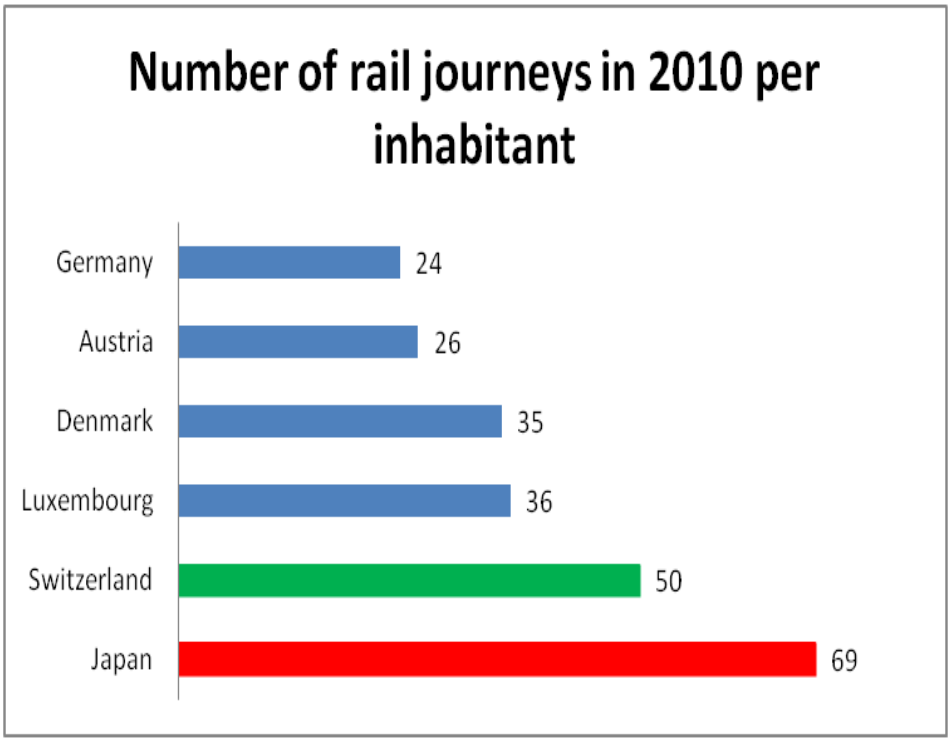
5. Institutional change "Swiss style"

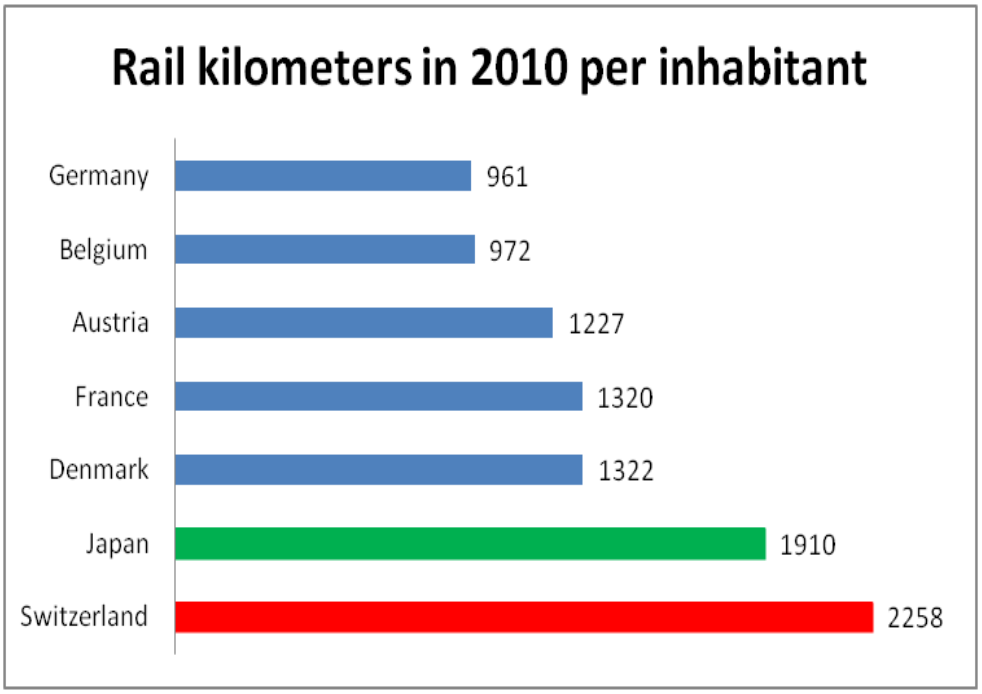
Why should one disintegrate and privatize the national symbol – as SBB has been ever since the nationalization of the former private railway companies in 1902? Even less so, when (almost) everybody thinks it works well. The last serious demands for a full privatisation of SBB date back to 2008. Nowadays, even liberal economists hold that a "going public of SBB" seems "not realistic" in the "short-run and in the medium term" – instead, a "full privatisation" is seen as "very long term" aim.[13] Even the demands of the current SBB management for more bargaining power and autonomy in tariff setting are met with opposition by a large alliance of regional politicians, passenger and cargo lobbies, consumerism activists, the Federal Price Controller and private businesses. So what do management and institutional reforms look like? The liberalisation steps for the *European Single Market* converged with the demands for a liberalisation of the service sector (WTO Uruguay round 1986, GATS 1995) also influencing the Swiss railway traffic policy. Although Switzerland is not a member of the European Union, the European reform agenda was to a certain degree in accordance with Swiss economic liberalisation policy, with some important exceptions: Switzerland has fairly known any state industries as its "liberal corporatism" (Peter Katzenstein) has provided a balance between public and private business interests. Therefore unlike some other countries, Switzerland did not undergo a major privatisation process from the1980s onwards. This is important when considering institutional change at Swiss railways: First of all, the railway reform process taking place between 1996 and 1999 introduced the commissioning principle. It means that cantonal authorities commission and pay for freight service and for local commuting transport whereas the long distance lines should work on a profitable base. Secondly, regional passenger traffic and transnational cargo

[13] Bruno Frey/Claudia Frey Marti, Privatisierung und Deregulierung. Reformen der Schweizer Infrastrukturpolitik , Zürich/Chur 2012.

were both opened for international (European) competition. Third point: SBB underwent a series of managerial reforms since the 1980s and was transformed into a public limited company according to a special federal law in 1999. The reform also wrote-off SBB's debts. In 2009, SBB became a corporation with four company divisions forming SBB Group. But SBB Ltd. continues to be owned by the Swiss Confederation, which holds 100% of SBB's shares up to this day. Apart from the obvious "success story" of SBB investments – expressed in the share of passenger kilometres and the number of transport customers as shown in the graphs at the end of this article – the veto points of federalism and direct democracy are an important explanation for the not-yet-full privatisation of SBB. These two institutions will sternly oppose any attempt which potentially creates regional imbalance and threatens the security and quality of public service. Apart from that, the very dense fixed interval timetable which integrates also the public tram, bus and ship transport and which is completed by the integral *tariff community* of all public transport carriers, creates a socio-technical path dependency: There is hardly any room for passenger rail competitors on the same tracks. Above all, the Swiss rail business case fares better than most of the other ones in Europe and (almost) as well as the Japanese case.

The Swiss solution is one of a state-owned company – SBB – which has undergone a series of managerial reforms and produced a number of successful innovations, next to the 44 so called private railway companies majority-owned by the Swiss cantons and the Confederation. Japan has gone a different way with the privatisation of Japanese Railways in 1987. But the outcome looks remarkably similar as these two graphs show:





Source: Railway Statistics Synopsis/LITRA 2010